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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/722,982	11/27/2000	Tinku Acharya	INTL-0493-US (P10273)	5885

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09/12/2003

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EXAMINER

DASTOURI, MEHRDAD

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 09/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/722,982

Applicant(s)

ACHARYA ET AL.

Examiner

Mehrdad Dastouri

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-15 is/are rejected.
- 7) ☒ Claim(s) 5,6 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 7, 8 and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Di Zenzo et al (Run-Based Algorithm for Binary Image Analysis and Processing).

Regarding Claim 1, Di Zenzo et al disclose a method comprising:

identifying a representation of a binary image in a pixel matrix, wherein the pixel matrix comprises a plurality of portions (Introduction, Page 83, Column 2, Paragraphs 1-4);

computing the number of runs for a first portion of the pixel matrix, wherein a run is a maximal sequence of pixels having a predetermined value in the first portion (Introduction, Page 83, Column 2, Paragraph 3; Page 84, Column 1, Section 2, Paragraphs 1 and 2; Figure 1. Runs are specified by a set three integers $S = \{(x_1, y_1, z_1), \dots, (x_N, y_N, z_N)\}$. In a vertical run "i", the number of sequence of pixels having a predetermined value (i.e., 1 or 0) is (y_i, z_i) .);

computing the number of neighboring runs between the first portion and a second portion of the pixel matrix, wherein a neighboring run is a run in which at least

one pixel of the run is in the neighborhood of a run in an adjacent portion (Figure 1;

Pages 84-85, Section 2, in particular Section 2, Paragraphs 3-8); and

computing the Euler number from the number of runs and the number of neighboring runs (Figure 1; Page 85, Sections 3.1 and 3.2).

Regarding Claim 2, Di Zenzo et al disclose the method of Claim 1, computing the number of runs for a first portion of the pixel matrix further comprising:

identifying one or more runs of the first portion (Introduction, Page 83, Column 2, Paragraph 3; Page 84, Column 1, Section 2, Paragraphs 1 and 2; Figure 1);

counting the number of runs (Figure 1; Page 84, Section 2, Paragraphs 1-8.

Runs are specified by a set three integers $S = \{(x_1, y_1, z_1), \dots, (x_N, y_N, z_N)\}$. In a vertical run "i", the number of sequence of pixels having a predetermined value (i.e., 1 or 0) is (y_i, z_i) .

Regarding Claim 3, Di Zenzo et al disclose the method of Claim 2, computing the number of neighboring runs between the first portion and a second portion of the pixel matrix further comprising:

determining a neighborhood size (Figure 1; Page 84, Section 2, the neighborhood comprising of sequence of adjacent runs P_1, P_2, \dots, P_n);

identifying a second run in the second portion (Figure 1, runs in portions 2 through 7; Pages 84-85, Sections 2, 3.1 and 3.2); and

determining whether at least one pixel of the second run is in the neighborhood of the run (Figure 1; Pages 84-85, Sections 2, 3.1 and 3.2).

With regards to Claims 7 and 8, arguments analogous to those presented for Claims 1 and 2 are applicable to Claims 7 and 8.

Regarding Claim 10, Di Zenzo et al disclose the system of Claim 7, wherein the portions comprise rows of the pixel matrix (Page 83, Section 1, Paragraph 3).

Regarding Claim 11, Di Zenzo et al disclose the system of Claim 7, wherein the portions comprise columns of the pixel matrix (Page 83, Section 1, Paragraph 3).

With regards to Claim 12, arguments analogous to those presented for Claim 1 are applicable to Claim 12.

With regards to Claim 13, arguments analogous to those presented for Claim 2 are applicable to Claim 13.

With regards to Claim 14, arguments analogous to those presented for Claim 3 are applicable to Claim 14.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 9 and 15 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Di Zenzo et al (Run-Based Algorithm for Binary Image Analysis and Processing) in view of Chiavetta et al (Digital Connectedness via Connectivity Graph).

Regarding Claim 4, Di Zenzo et al disclose the method of Claim 3, computing the Euler number from the number of runs and the number of neighboring runs further comprising:

subtracting the number of neighboring runs between the first portion and the second portion from a sum of the number of runs in the first portion and the second portion to arrive at a result (Figure 1; Page 85, Section 3.2).

Di Zenzo et al do not explicitly disclose adding the result to an Euler number for a third portion.

Chiavetta et al disclose analysis of binary image topological properties by computing the Euler number of different portions of the image and adding the result to an Euler number for a third portion (Pages 647-649, Section 3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Di Zenzo et al invention according to the teachings of Chiavetta et al to add the result summing and subtraction of the portions runs to an Euler number for a third portion because it will provide an enhanced visualization of the image topological properties and will facilitate search of connected components by resolving shape and visibility problems (Chiavetta et al; Abstract).

With regards to Claims 9 and 15, arguments analogous to those presented for Claim 4 are applicable to Claims 9 and 15.

Allowable Subject Matter

5. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 of the instant invention recites the method of Claim 4, computing the Euler number from the number of runs and the number of neighboring runs further comprising:

subtracting from the result the number of neighboring runs between the third portion and a prior third portion.

The features identified are neither discussed nor suggested by the prior arts of record.

Claim 6 depends on Claim 5, and is therefore allowable.

Claim 16 recites the storage medium corresponding to the method Claim 5, and is therefore allowable.

Other prior art cited

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 3,905,018 to Gray is cited for a binary image processor.

U.S. Patent 6,335,986 to Naoi et al is cited for a pattern recognizing apparatus and method.

IEEE Paper ISBN: 0-8186-2920 to Chiavetta et al is cited for Digital Connectedness via Connectivity Graph.

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Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center Customer Service Office whose telephone number is (703) 306-0337.

MEHRDAD DASTOURI
PRIMARY EXAMINER



Mehrdad Dastouri
Primary Examiner
Group Art Unit 2623
September 4, 2003